

NOTES ON THE GENUS *GLOSSOCARYA* (VERBENACEAE)

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Time is no longer available, this late in life, to complete the detailed monograph which was planned and announced for all the genera of *Verbenaceae* and the families segregated therefrom, but it seems worthwhile to place on record, for future monographers, the bibliographic and herbarium notes assembled by my wife, Alma L. Moldenke, and myself on this genus over the past 52 years. This is the 75th genus thus far treated in this series of papers and the herbarium acronyms employed are the same as have been used by me in all previous parts of this continuing series in this and certain other journals and most recently explained in *Phytologia Memoirs* 2: 463--469 (1980) and *Phytologia* 50: 268 (1982).

GLOSSOCARYA Wall., Numer. List [47], no. 1741, hyponym. 1829; W. Griff., Calcut. Journ. Nat. Hist. 3: 366. 1843.

Synonymy: *Glossocarya* "Wall. ex Griff." apud Airy Shaw in J. C. Willis, Dict. Flow. Pl., ed. 7, 482. 1966. *Glossocaryum* Smitinand ex Mold., *Phytologia* 34: 274, in syn. 1976.

Bibliography: L. f., Suppl. Pl. 292. 1781; J. F. Gmel. in L., Syst. Nat., ed. 13, imp. 1, 2: 961 (1789) and imp. 2, 2: 961. 1796; Raeusch., Nom. Bot., ed. 3, 182. 1797; Lam., Encycl. Méth. Bot. 8: 691. 1808; Pers., Sp. Pl. 3: 364. 1819; Moon, Cat. Indig. Exot. Pl. Ceyl. 1: 46. 1824; Wall., Numer. List [47], no. 1741. 1829; Bojer, Hort. Maurit. 256. 1837; Endl., Gen. Pl. 638. 1838; Meisn., Pl. Vasc. Gen. Comm. 2: 197. 1840; Steud., Nom. Bot. Phan., ed. 2, 1: 419 & 689. 1840; Spach, Hist. Nat. Vég. 9: 228. 1840; Reichenb., Deutsch. Bot. [Repert. Herb. Nom.] 108. 1841; W. Griff., Calcut. Journ. Nat. Hist. 3: 366--367. 1843; Voigt, Hort. Suburb. Calcut. 464 & 474. 1845; Walp., Repert. Bot. Syst. 4: 133--134. 1845; Lindl., Veg. Kingd., ed. 1, 664 & 862 (1846) and ed. 2, 664 & 862. 1847; Schau. in A. DC., Prodr. 11: 624--626, 657, & 662. 1847; A. L. Juss. in Orbigny, Dict. Univ. Hist. Nat. 13: 185. 1849; Lindl., Veg. Kingd., ed. 3, 664 & 862. 1853; Miq., Fl. Ind. Bat. 2: 858 & 903. 1856; Schnitzl., Iconogr. Fam. Nat. 2: 137 Verbenac. [3]. 1856; Buek, Gen. Spec. Syn. Candol. 3: 200 & 503. 1858; Thwaites & Hook. f., Enum. Pl. Zeyl., imp. 1, 243. 1861; Bocq., Adansonia, ser. 1, 2: 87, 111, & 130 (1862) and 3: 179, 180, & 207. 1862; Bocq., Rév. Verbenac. 110 & 111. 1863; F. Muell., Fragm. 6: 151--152. 1868; Benth. & F. Muell., Fl. Austral. 5: 61. 1870; Pfeiffer, Nom. Bot. 1 (2): 1460. 1874; F. Muell., Fragm. 9: 5. 1875; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1136 & 1158. 1876; Kurz, Forest Fl. Brit. Burma 2: 252 & 257--258. 1877; Maxim., Bull. Acad. Imp. Sci. St. Pétersb. 23: 390. 1877; Gamble, Man. Indian Timb., ed. 1, 281, 282, & 509. 1881; F. Muell., First Census 103. 1882; F. M. Bailey, Syn. Queensl. Fl. 380. 1883; C. B. Clarke in Hook. f., Fl. Brit. India 4: 561 & 598. 1885; Trimen, Journ. Ceyl. Br. Roy. Asiat. Soc. 9: [Syst. Cat. Ceyl. Pl.] 69. 1885; Durand, Ind. Gen. Phan.

322. 1888; F. Muell., Sec. Census 173. 1889; F. M. Bailey, Cat. Pl. Queensl. 36. 1890; Baill., Hist. Pl. 11: 87 & 115--116 (1891) and 11: 490. 1892; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 1035. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a):133, 177, & 178. 1895; Trimen, Handb. Fl. Ceyl. 3: 345 & 361--362. 1895; Trimen, Hand. Fl. Ceyl. Atlas 3: pl. 73. 1895; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 382. 1897; F. M. Bailey, Queensl. Fl. 4: 1181 & 1182. 1901; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 184. 1902; Gamble, Man. Indian Timb., ed. 2, imp. 1, 524 & 544--545. 1902; Dalla Torre & Harms, Gen. Siphonog., imp. 1, 433. 1904; Post & Kuntze, Lexicon 251 & 688. 1904; Brandis, Indian Trees, imp. 1, 502 & 512. 1906; Craib, Kew Bull. Misc. Inf. 1911: 445. 1911; Ridl., Journ. Roy. Asiat. Soc. Straits 59: 157. 1911; J. C. & M. Willis, Rev. Cat. Flow. Pl. Ceyl. [Perad. Man. Bot. 2:] 69 & 157. 1911; Craib, Contrib. Fl. Siam Dicot. 166. 1912; F. M. Bailey, Compreh. Cat. Queensl. Pl. 386 & 389, fig. 365. 1913; Druce, Bot. Exch. Club Rep. 4: 615. 1917; Prain, Ind. Kew. Suppl. 5, imp. 1, 115. 1921; Craib, Kew Bull. Misc. Inf. 1922: 240. 1922; Gamble, Man. Indian Timb., ed. 2, imp. 1, 524. 1922; Ridl., Fl. Malay Penins. 2: 611 & 636--637. 1923; Domin, Bibl. Bot. 89 (6): 1112--1113, fig. 180. 1928; Fedde, Justs Bot. Jahresber. 47 (2): 245 & 322. 1929; A. W. Hill, Ind. Kew. Suppl. 7: 103. 1929; Ridl., Dispers. Pl. World pl. 9. 1930; Stapf, Ind. Lond. 2: 82 (1930) and 3: 293. 1930; Fedde & Schust., Justs Bot. Jahresber. 53 (1): 1074. 1932; A. W. Hill, Ind. Kew. Suppl. 8: 102. 1933; Junell, Symb. Bot. Upsal. 1 (4): 116, 119--120, & 204, fig. 184 & 185. 1934; Dop in Lecomte, Fl. Gén. Indo-Chine 4: 776, 874, & 886--888, fig. 90 (9) & 91 (1--3). 1935; Beer & Lam, Blumea 2: [221] & 226. 1936; L. f., Suppl. Pl., imp. 2, 292. 1936; Wangerin, Justs Bot. Jahresber. 56 (1): 668. 1936; Fedde & Schust., Justs Bot. Jahresber. 56 (2): 285. 1937; Fletcher, Kew Bull. Misc. Inf. 1937: 174 (1937) and 1938: 205--206, 401, 405--407, 409, & 437--438. 1938; E. D. Merr., Journ. Arnold Arb. 19: 64 (1938) and 21: 385. 1940; Mold., Prelim. Alph. List Inv. Names 26. 1940; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 184. 1941; Worsdell, Ind. Lond. Suppl. 1: 438. 1941; Mold., Alph. List Inv. Names 20 & 25. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 55, 56, 59, 60, 67, 69, & 93. 1942; Lemée, Dict. Descrip. Syn. Gen. Pl. Phan. 8b: 657. 1943; MacMillan, Trop. Plant. Gard., ed. 5, 136. 1943; Savage, Cat. Linn. Herb. Lond. 110. 1945; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 1035. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 100. 1947; H. N. & A. L. Mold., Pl. Life 2: 23, 24, 34, & 69. 1948; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 129, 130, 136--138, 149, 153, & 186. 1949; Angely, Cat. Estat. Gen. Bot. Fan. 17: 4. 1956; Iljin, Acad. Sci. Bot. Inst. Dept. Repr. Mat. Hist. Fl. Veg. USSR 3: 216. 1958; Abeywickrama, Ceyl. Journ. Sci. Biol. 2: 218. 1959; Anon., Kew Bull. Gen. Ind. 1929--1956: 134. 1959; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 3, 184. 1959; Mold., Phytologia 7: 81--82. 1959; Mold., Résumé 166, 167, 176, 178, 180, 201, 209, 211, 218, 264, 266, 268, 270, 273, 296, 392, 413, 456, & 494. 1959; Mold., Résumé Suppl.

1: 12 & 25. 1959; Airy Shaw in J. C. Willis, *Dict. Flow. Pl.*, ed. 7, 482. 1960; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, imp. 3, 1: 1035. 1960; Mold., *Biol. Abstr.* 35: 1688. 1960; Prain, *Ind. Kew. Suppl.* 5, imp. 2, 115. 1960; Thwaites & Hook. f., *Enum. Pl. Zeyl.*, imp. 2, 243. 1961; Willaman & Schubert, *Agr. Res. Serv. U. S. Dept. Agr. Tech. Bull.* 1234: 237. 1961; Hocking, *Excerpt. Bot.* A.4: 592. 1962; Dalla Torre & Harms, *Gen. Siphonog.*, imp. 2, 433. 1963; Melchior in Engl., *Syllab. Pflanzenfam.*, ed. 12, 2: 437. 1964; Thwaites & Hook. f., *Enum. Pl. Zeyl.*, imp. 2, 243. 1964; F. A. Barkley, *List Ord. Fam. Anthoph.* 76 & 168. 1965; Airy Shaw in J. C. Willis, *Dict. Flow. Pl.*, ed. 7, 482. 1966; G. Taylor, *Ind. Kew. Suppl.* 13: 61 & 149. 1966; Gunawardena, *Gen. Sp. Pl. Zeyl.* 148. 1968; Keng, *Ord. Fam. Malay. Seed Pl.* 278. 1969; Rouleau, *Guide Ind. Kew.* 81 & 352. 1970; Brandis, *Indian Trees*, imp. 2, 502 & 512. 1971; Mold., *Fifth Summ.* 1: 281, 283, 296, 301, 305, 336, 346, 349, 363, 446, 449, 454, 456, & 463 (1971) and 2: 523, 734, & 879. 1971; Mukhopadhyay, *Pollen Morph. Verb.* [thesis]. 1971; Clifford & Ludlow, *Keys Fam. Gen. Queensl. Flow. Pl.* 124 & 202. 1972; Gamble, *Man. Indian Timb.*, ed. 2, imp. 2, 524 & 544--545. 1972; Mold., *Phytologia* 23: 423, 432, & 507. 1972; Airy Shaw in J. C. Willis, *Dict. Flow. Pl.*, ed. 8, 494. 1973; Thanikaimoni, *Inst. Franç. Pond. Trav. Sect. Scient. Techn.* 12 (2): 57. 1973; Mold., *Phytologia* 28: 448, 458, & 509 (1974), 34: 19, 264, 274, & 504 (1976), and 35: 111. 1976; Thanikaimoni, *Inst. Franç. Pond. Trav. Sect. Scient. Techn.* 13: 104 & 328. 1976; Mold., *Biol. Abstr.* 63: 6590 (1977) and 64: 6575. 1977; Mold., *Phytologia* 36: 38, 42, 437--438, & 505 (1977) and 38: 498 & 507. 1978; Mold., *Biol. Abstr.* 66: 1277. 1978; Mukherjee & Chanda, *Trans. Bose Res. Inst.* 41: 45 & 47. 1978; Hocking, *Excerpt. Bot.* A.33: 87. 1979; Mold., *Phytologia* 44: 221 & 508. 1979; Mold., *Phytol. Mem.* 2: 268, 273, 286, 288, 289, 293, 296, 298, 327, 336, 340, 354, 379, 387, 388, 407, 408, 461, 462, 548, & 549. 1980; Mold., *Phytologia* 47: 335 & 506 (1981), 48: 122 & 508 (1981), and 49: 442. 1981.

Mostly pubescent or gray-tomentose, scandent or subscandent shrubs; leaves decussate-opposite, short-petiolate; leaf-blades mostly ovate or obovate to subrotund and entire; inflorescence determinate and centrifugal, cymose, the cymes dichotomous, closely many-flowered, usually arranged in a large, dense, terminal, corymbose panicle; flowers small, numerous, often sessile, complete, perfect, hypogynous; bracts small or minute or some of the lowermost sometimes foliaceous; calyx inferior, gamosepalous, campanulate or tubular-campanulate, hardly at all accrescent, the rim spreading and 5-toothed, the teeth mostly broad-based; corolla gamopetalous, mostly hypocrateriform or infundibular, the tube narrow-cylindric, apically ampliate, the limb subbilabiate, 5-lobed or 5-fid, the 2 posterior lobes exterior in bud and connate for a slightly longer distance, the 3 anterior ones subequal and flat or the middle interior (lower) one slightly larger and rather concave; stamens 4 or rarely 5, didynamous, inserted in the corolla-throat, long-exserted; filaments slender and usually very long; anthers ovate or ovate-oblong, the 2 thecae parallel, attached above the

middle by a rather inconspicuous connective; pistil single, compound, bicarpellary; style filiform, apically bifid, the branches subulate and apically stigmatiferous; ovary superior, compound, imperfectly 4-loculate, 4-ovulate; fruit capsular, oblong, somewhat ampliate apically, exserted from the fruiting-calyx, 4-valvate, substipitate, the valves narrowly obovoid, their margins inflexed or involute from above or from slightly below the middle, placentiferous, each holding one seed by its inflexed margin, dehiscing from the base or from the middle, freeing a persistent, naked, central column, forming 1-seeded pyrenes which are extended basally into a short or linear wing; seeds oblong, erect, narrow, exalbuminous.

Type species: *Glossocarya mollis* Wall.

This is a small genus of about 12 specific and infraspecific taxa native from Sri Lanka, Burma, and Thailand east to Indochina and Malaya and south to Australia, the Great Barrier Reef, and New Guinea; one species is occasionally cultivated elsewhere.

Briquet (1895) speaks of "8 staminodes", but such a character has not been observed by anyone else and is probably erroneous.

The generic name is derived from the Greek, *glossa*, a tongue, and *karyon*, a nut, in allusion to the fruit-valves each bearing a single seed under an involute tongue-like margin. Schauer (1847) knew only a single (the type) species. Most later authors, like Bentham (1876), Clarke (1885), and Dalla Torre & Harms (1904), credited the genus with 3 species, and so did Durand (1888), Trimen (1895), and Dop (1936); Post & Kuntze (1904) and Ridley (1923) increased the number to 4, while Angely (1956 raised the number to 8. Reichenbach (1841) classified the genus in the "Aegiphilear."; Schauer (1847) placed it in the *Caryopterideae*. Bocquillon (1863) sank it in the synonymy of *Caryopteris* Bunge.

Several inaccuracies in bibliographic citations occurring in the literature of the genus ought to be mentioned here. Domin (1928) cites the Bentham & Mueller (1870) reference to as "1865" and the Miquel (1858) reference is often cited as "1857". The Schnitzlein (1858) reference is often cited as "1843--1870", the titlepage date, but the page involved here was issued in 1858. Similarly, the Endlicher (1838) work is usually cited by its titlepage date of "1836--1856", but the part involved here was actually issued in 1838. The Bailey (1913) reference is often cited as "1909--1913", but, according to Stafleu, the entire work was not issued until 1913. Angely (1956) gives "1831" and "1876" as the dates of the original publication and of the later validation of the generic name, but "1829" and "1843" appear to be the correct dates. Pfeiffer (1874) dates Wallich's original publication of the genus as "1831", but "1829" is correct for the page involved.

The Briquet work is often cited as "1894", the date which appears on the section wrapped-cover, but Stafleu [Tax. Lit. 148. 1967] insists that it was not actually issued until 1895. The Bentham & Hooker (1876) is usually cited to both authors, but the family *Verbenaceae* was actually authored by Bentham alone [cfr.

"On the joint and separate work of the authors of Bentham & Hooker's *Genera Plantarum*" in *Journ. Linn. Soc. Lond. Bot.* 20: 304--308. 1883].

Junell (1934) says that "Die Gattungen *Caryopteris* und *Glossocarya* weichen eigentlich nur hinsichtlich des Fruchtbaus von *Clerodendreae* ab." Maximowicz (1877) comments that "Genus *Glossocaryae* Wall., mihi tantum ex *Gl. Linnaei* Thw. (sub *Clerodendro*) florens notum, calyce oblongo, corollae tubo gracili, habitu *Clerodendri* discrepans, a Bocquillon....cum *Caryopteride* jungitur, a Benthamio autem servatur et augetur. Calyce 5-dentato cum *Phasianuro* convenit, sed fructus ex descriptione potius *Caryopteridis*."

Excluded taxa:

Glossocarya pinnatifida Steud., *Nom. Bot. Phan.*, ed. 2, 1: 419, in ins. 1840= *Glossogyne pinnatifida* P. DC., *Carduaceae*

A tentative artificial key to the accepted taxa

1. Seeds basally alate; gynophore present.....*G. hemiderma*.
- 1a. Seeds not basally alate; no gynophore present.
2. Lower surface of leaf-blades glandular-punctate.
3. Mature leaf-blades marginally crenate.....*G. crenata*.
- 3a. Mature leaf-blades marginally entire.
4. Inflorescence very compact; apex of leaf-blades rounded.....*G. premnoides*.
- 4a. Inflorescence loose; apex of leaf-blades acute or apiculate.
5. Leaf-blades pilose or puberulent beneath only on the venation, eventually glabrous.....*G. scandens*.
- 5a. Leaf-blades permanently densely pubescent on the whole lower surface....*G. scandens* var. *pubescens*.
- 2a. Lower surface of leaf-blades not glandular-punctate.
6. Mature leaf-blades usually glabrous on the lamina beneath.....*G. siamensis*.
- 6a. Mature leaf-blades not glabrous beneath.
7. Leaf-blades pilose-pubescent, thinly tomentose, or subvelutinous beneath.
8. Leaf-blades merely more or less spreading pilose-pubescent (especially on the larger veins) beneath.
9. Leaf-blades basally cordate. *G. siamensis* var. *pubescens*.
- 9a. Leaf-blades basally truncate or rounded..*G. mollis* var. *maxwellii*.
- 8a. Leaf-blades tomentose to subvelutinous beneath.
10. Capsules spreading gray-pilose; corolla to 10 mm. long.
11. Leaf-blades to 6.5 cm. long, apically obtuse, densely soft-pubescent above; calyx externally tomentose; corolla-lobes 2.5 mm. long; Australia.....*G. calcicola*.
- 11a. Leaf-blades to 10 cm. long, apically usually a-

cute or acuminate to mucronate, obsolete puberulent above; corolla-lobes 4 mm. long; Burma to Malaya.....*G. mollis*.

10a. Capsule merely gray-strigose; corolla to 16.5 mm. long.....*G. longiflora*.

7a. Leaf-blades merely puberulent beneath.....*G. puberula*.

GLOSSOCARYA CALCICOLA Domin, *Bibl. Bot.* 89: 1112--1113, fig. 180. 1928.

Bibliography: Domin, *Bibl. Bot.* 89: 1112--1113, fig. 180. 1928; A. W. Hill, *Ind. Kew. Suppl.* 8: 102. 1933; Wangerin, *Justs Bot. Jahresber.* 56 (1): 668. 1936; Fedde & Schust., *Justs Bot. Jahresber.* 56 (2): 285. 1937; Mold., *Known Geogr. Distrib. Verbenac.*, ed. 1, 69 & 93. 1942; Worsdell, *Ind. Lond. Suppl.* 1: 438. 1941; Mold., *Known Geogr. Distrib. Verbenac.*, ed. 2, 153 & 186. 1949; Mold., *Résumé* 209 & 456. 1959; Mold., *Fifth Summ.* 1: 346 (1971) and 2: 879. 1971; Mold., *Phytol. Mem.* 2: 336 & 548. 1980.

Illustrations: Domin, *Bibl. Bot.* 89: 1113, fig. 180. 1928.

A large scandent shrub; branches thick; branchlets canescent-tomentose; leaves decussate-opposite, short-petiolate, dense on the branchlets; petioles about 5 mm. long, tomentose-pubescent; leaf-blades chartaceous-coriaceous, cordate-orbicular or broadly cordate-ovate, 4--6.5 cm. long, 4--5.5 cm. wide, apically obtuse, marginally entire, basally cordate, green and shiny above but shortly and softly puberulent-pubescent, incanous and more densely and softly subtomentose-pubescent beneath; principal venation prominulous and rather closely reticulate beneath; cymes many-flowered, dense, forming a large, very dense, compact, terminal, corymbose panicle; bracts foliaceous, subtomentose, some short-stalked and resembling miniature leaves, others narrow and sessile; flowers subsessile; calyx narrowly campanulate, about 3.2 mm. long, externally incanous-tomentose, the rim 5-lobed, the lobes very short, apically acute; corolla-tube slender, twice (or somewhat more) as long as the calyx, internally glabrous, externally farinose-subtomentose except for the base, the lobes oblong, about 2.5 mm. long, apically very obtuse, externally farinose; stamens very long-exserted; fruiting-calyx about 6 mm. long; capsule twice as long as the fruiting-calyx, barbate-villous above with long spreading hairs.

The species is based on an unnumbered Domin collection from the limestone hills at Chillagoe, in northern Queensland, Australia, where it is said to be a widespread liana, collected on February 9, 1910. Domin (1928) says that it is a distinct species different from the other Australian species, *G. hemiderma* (F. Muell.) Benth., and closely related to the "eastern Indian" *G. mollis* Wall. It is worth noting that Hill (1933) cites page "558" as the page for Domin's original description, but this appears to be an error; it occurs on pp. 1112--1113 and there only.

GLOSSOCARYA CRENATA Fletcher, *Kew Bull. Misc. Inf.* 1938: 205. 1938.

Bibliography: Fletcher, *Kew Bull. Misc. Inf.* 1938: 205, 405, 409,

& 437--438. 1931; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 60 & 93. 1942; Hill & Salisb., Ind. Kew. Suppl. 10: 100. 1947; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 137 & 186. 1949; Mold., Résumé 178 & 456. 1959; Mold., Fifth Summ. 1: 296 (1971) and 2: 879. 1971; Mold., Phytol. Mem. 2: 286 & 548. 1980.

A diffuse shrub; branches obtusely tetragonal, fulvous-tomentose; leaves decussate-opposite; petioles 0.5--1 mm. long, slightly canaliculate above; leaf-blades chartaceous, gray-green on both surfaces, ovate, 2--3.5 cm. long, 2--3 cm. wide, apically rounded, marginally deeply crenate and glabrous or ciliate, basally lightly cordate, sparsely glandulose and pubescent above with the hairs more numerous on the midrib and secondaries, tomentose beneath and with numerous amber-colored glands; midrib conspicuous above, slightly prominent beneath; secondaries 3 or 4 pairs, parallel, conspicuous above, prominulous beneath; tertiaries few, irregular; inflorescence terminal, corymbose-paniculate, 4 cm. long, basally 4--6 cm. wide; calyx externally conspicuously pubescent and glandulose, its tube 3 mm. long, internally glabrous, the limb 5-lobate, the lobes 0.8 mm. long, basally 1.5 mm. wide, internally glabrous; corolla white, externally conspicuously pubescent and glandulose, the tube 14 mm. long, internally glabrous except for a very few long hairs, the lobes 5, subequal, 3--4 mm. long, 1 mm. wide; stamens 4; filaments 20 mm. long, inserted about 8 mm. above the base of the corolla-tube; anthers purple, 1 mm. long; style 15 mm. long, apically bilobed; ovary globose, about 1 mm. long and wide, externally apically sericeous-pilose.

This species is based on *Lakshnakara 1083* from near the railway lines at Kawnken, Udawn, Thailand. The collector describes the plant as a shrub, the corollas white, and the anthers pink, and found it in anthesis in July. Fletcher (1938) says "*G. premnoidi* Rfl. foliis glanduloso-punctatis affinis, sed foliis minoribus, pubescentibus crenatis differt".

The *Smitinand 2941*, distributed as *G. crenata*, actually is *G. siamensis* Craib.

Citations: THAILAND: *Lakshnakara 1053* (Ed, Z).

GLOSSOCARYA HEMIDERMA (F. Muell.) Benth. in Benth. & Hook. f., Gen. Pl. 2: 1158. 1876.

Synonymy: *Clerodendron (Hemiderma) linnaei* F. Muell. ex Benth. & F. Muell., Fl. Austral. 5: 61, in syn. 1870 [not *C. linnaei* Thwaites, 1861]. *Clerodendron hemiderma* F. Muell. in Benth. & F. Muell., Fl. Austral. 5: 61. 1870. *Glossocarya hemiderma* Benth. & Hook. f. apud Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1:1035. 1893. *Glossocarya hemiderma* (F. v. M.) Benth. apud Junell, Symb. Bot. Upsal. 1 (4): 119. 1934. *Glossocarya hemiderma* Benth. & Hook. apud Mold., Résumé 296, in syn. 1959.

Bibliography: F. Muell., Fragm. 6: 151. 1868; Benth. & F. Muell., Fl. Austral. 5: 61. 1870; F. Muell., Fragm. 9: 5. 1875; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1136 & 1158. 1876; Maxim., Bull. Acad. Sci. St. Pétersb. 23: 390. 1877; F. Muell., First Census 103.

1882; F. M. Bailey, Syn. Queensl. Fl. 380. 1883; F. Muell., Sec. Census 173. 1889; F. M. Bailey, Cat. Fl. Queensl. 36. 1890; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 1035. 1893; F. M. Bailey, Queensl. Fl. 4: 1182. 1901; F. M. Bailey, Compreh. Cat. Queensl. Fl. 386 & 389, fig. 365. 1913; Domin, Bibl. Bot. 89 (6): 1112. 1928; Stapf, Ind. Lond. 3: 293. 1930; Junell, Symb. Bot. Upsal. 1 (4): 116 & 119--120, fig. 184. 1934; Beer & Lam, Blumea 2: 221 & 226. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 67, 69, & 93. 1942; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 1035. 1946; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 149, 153, & 186. 1949; Mold., Résumé 201, 209, 211, 264, 266, 296, & 456. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 1: 1035. 1960; Willaman & Schubert, Agr. Res. Serv. U. S. Dept. Agr. Tech. Bull. 1234: 237. 1961; Mold., Fifth Summ. 1: 336, 346, 349, 446, & 449 (1971) and 2: 523 & 879. 1971; Mold., Phytologia 28: 448. 1974; Mold., Phytol. Mem. 2: 327, 336, 340, & 548. 1980.

Illustrations: F. M. Bailey, Compreh. Cat. Queensl. Fl. 389, fig. 365. 1913; Junell, Symb. Bot. Upsal. 1 (4): 119, fig. 184. 1934.

A straggling or scandent large shrub, 2--3 m. tall, tall woody climber, or even canopy liana ascending to the crown of large trees, the young parts more or less hoary-pubescent with appressed hairs, later glabrescent; leaves decussate-opposite, short-petiole; leaf-blades chartaceous, dull dark-green above, lighter green beneath, broadly ovate or cordate-ovate, mostly 5--8 cm. long, flat, apically obtuse or shortly and obtusely acuminate, marginally entire, soon glabrous; flowers small, numerous, sweet-scented, arranged to rather compact or very compact, trichotomous, corymbose, many-flowered cymes, terminal or on short twigs or leafless divaricate peduncles in the upper leaf-axils, more or less hoary-pubescent; primary bracts sometimes oblong-lanceolate, basally contracted, and stipitate, but mostly small and narrow to linear-oblong, 1--2 mm. long; peduncles short, divaricate; calyx narrowly campanulate or obconic-campanulate to obovoid, about 2--3 mm. long, the rim minutely 5-dentate or repand-denticulate, sometimes truncate; corolla infundibular, white, about 12 mm. long, externally more or less sericeous, the tube slender, to 6 mm. long, apically somewhat amplicate, shortly exserted, basally and internally glabrous, the 5 oval lobes about 1.5 mm. long, almost equal, externally more or less silky-pubescent; stamens inserted in the corolla-tube, capillary, about 3 mm. long; anthers dorsifixed, oval, the thecae parallel, about 0.5 mm. long; stigma very short, setaceous-subulate; fruiting-calyx thinly chartaceous, often more than 4 mm. long but remaining narrow, enclosing the lower half of the fruit; fruit oblong to ellipsoid-obconic, 6--8 mm. long, apically obtuse, the exserted portion externally pubescent to hirsute, basally bilocular but 4-locular in the upper part where the endocarp enfolds the seeds and separates into 4 narrow nuts, the lower seedless portion resembling a wing on each nut, the lower portion of the dissepiment remaining attached to the receptacle after the nuts have fallen as a cuneate-oblong gynophore which is 3-toothed apically and nearly as long as the calyx.

Mueller (1868) describes the fruit in detail: "Pericarpium cujusque carpидii longe trans basim seminis descendens, hinc glabrum, pellucens, fere scariosum. Carpidia etiam altero latere interiore a basi ad apicem aperta. Spermatophorum 2--3" altum, apice subulatum, placentis 2 laterali-terminalibus fere cornutum, basi attenuatum, omnino persistens. Semina perfecta non accepti."

Bentham & Mueller (1870) comment that "This plant has a singular resemblance with the Cingalese *C. Linnaei*, Thw. which has the same climbing habit, foliage, and inflorescence, but rather larger flowers, the outer bracts much larger, broader, and foliaceous, and the fruit, although nearly similar in shape, is much more normal, without the flat winglike bases of the nuts or the persistent axis upon which F. Mueller has founded his sectional character of *Hemiderma*." They cite unnumbered collections of Bowman, Daemel, Dallachy, and Thozet from Queensland.

Collectors have found this plant "common" or "very common" in mixed softwood forests, in rainforests on limestone, and along roadsides, flowering in May, June, October, and November, in fruit in April. The corollas are said to have been "white" on all collections where the color was noted.

It should be noted that Domin (1928) cites the Bentham & Mueller work (1870), listed in the bibliography (above), as published in "1865", but Stafleu, Tax. Lit. 28 (1967) avers that it was actually published between August and October, 1870.

Junell (1934) notes that *G. hemiderma* has "verhältnissmässig grosse 'falsche' Scheidewände. Diese verwachsen im unteren Teil des Fruchtknotens mit den ihrerseits verwachsenen Plazenten.... Auch *G. hemiderma* hat eine deutliche Gynobasis und einen ähnlich-er Flügel an ihren Nüsschen" [like that seen in *G. mollis* Wall.].

Beer & Lam (1936) cite *Brass* 5674 from Papua, New Guinea, and note that this is the first record of the genus and species in New Guinea. "The disjunct area of the genus (Ceylon, Further India, Queensland) is, however, but little filled up by the discovery of *G. hemiderma* in Papua." Actually, the genus is not known from India, but is known from Sri Lanka, Burma, Thailand, Cambodia, Vietnam, Malaya, New Guinea, Great Barrier Reef, and Australia, so the distribution of the genus is hardly "disjunct".

Domin (1928) cites *Dietrich* 460, 803, 876, 902, 951, & 1331 and two unnumbered Domin collections from Queensland, where he regarded the species as endemic.

Material of this species has been misidentified and distributed in some herbaria as *Clerodendron* sp.

Citations: NEW GUINEA: Papua: *Brass* 5674 (Bz--21044, Le--936.190-457, N), 8243 (Le--938.137-370), 21984 (Ng--17090, W--2495604); *Carr* 11471 (Le--936.114-220); *Streimann & Kairo* LAE.1567 (Kl--17062). AUSTRALIA: Northern Australia: *F. Mueller* s.n. (Pd). Queensland: *Francis* s.n. [3/20] (W--1171680); *F. Mueller* s.n. [Rockhampton] (Pd); *C. T. White* 12490 (Ca--937610, W--1991863); *C. L. Wilson* 709 (Dt). GREAT BARRIER REEF: Thursday: *Jaheri* s.n. [19/5/1901] (Bz--21046, N).

GLOSSOCARYA LONGIFLORA Fletcher, Kew Bull. Misc. Inf. 1938: 205--206. 1938.

Bibliography: Fletcher, Kew Bull. Misc. Inf. 1938: 205--206, 405, & 438. 1938; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 60 & 93. 1942; Hill & Salisb., Ind. Kew. Suppl. 10: 100. 1947; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 137 & 186. 1949; Mold., Résumé 178 & 456. 1959; Mold., Fifth Summ. 1: 296 (1971) and 2: 879. 1971; Mold., Phytol. Mem. 2: 268 & 548. 1980.

A scandent shrub; branchlets obtusely tetragonal, at first lightly tomentose, later glabrous; leaves decussate-opposite; petioles 5--10 mm. long, fulvous-tomentose; leaf-blades chartaceous, brunneous or often green-tinged above (in drying), brunneous or grayish-brunneous beneath, ovate or elliptic, 4--10 cm. long, 3.5--7 cm. wide, apically obtuse or obtusely apiculate and subacuminate, marginally entire, revolute, and ciliate, basally cordate, lightly pubescent above, tomentose and glandulose beneath with sessile amber-colored glands; midrib conspicuous above, prominent beneath; secondaries 5 or 6 pairs, conspicuous above, prominulous beneath; tertiaries few, irregular; inflorescence terminating lateral branches, 3--8 cm. long, basally 6--10 cm. wide; calyx externally densely tomentose, its tube 3 mm. long, basally very much sericeous within, otherwise internally glabrous, the rim sinuate; corolla white, externally tomentose, its tube 11.5--12 mm. long, internally glabrous, the lobes 5, subequal, 3--4.5 mm. long, 2.5--3.5 mm. wide; stamens 4; filaments 18--20 mm. long; anthers 1 mm. long; style 25 mm. long, apically bilobed; ovary glabrous, about 1 mm. long and wide, externally apically sericeous-pilose; capsule 8--10 mm. long, 3 mm. wide, externally grayish-strigose.

The species is based on *Lakshnakara 284* from Keng Koi, Saraburi, Ayuthia, Thailand. Fletcher (1938) cites also *Annandale 1832* from Lower Thailand, and says: "*G. molli* Wall. affinis, sed corollae tubo majore, capsula pilis griseis strigosis munita differt; nec non *G. siamensi* Craib affinis, sed foliis tenuiter tomentosus, corollae tubo majore differt."

GLOSSOCARYA MOLLIS Wall., Numer. List [47], no. 1741, hyponym 1829; W. Griff., Calcut. Journ. Nat. Hist. 3: 366--367. 1843.

Synonymy: *Caryopteris glossocarya* Bocq., *Adansonia*, ser. 1, 2: 111, nom. nud. 1862. *Glossocarya mollis* "Wall. ex Griff." ex Mold., Phytol. Mem. 2: 408, in syn. 1980.

Bibliography: Wall., Numer. List [47], no. 1741. 1829; Steud., Nom. Bot. Phan., ed. 2, 1: 689. 1840; W. Griff., Calcut. Journ. Nat. Hist. 3: 366--367. 1843; Voigt, Hort. Suburb. Calc. 474. 1845; Walp., Repert. Bot. Syst. 4: 134. 1845; Schau. in A. DC., Prodr. 11: 626. 1847; Buek, Gen. Spec. Syn. Candel. 3: 200. 1858; Bocq., *Adansonia*, ser. 1, 2: 111 (1862) and 3: 207. 1862; Bocq., Rév. Verbenac. 111 & 207. 1863; Kurz, Forest Fl. Brit. Burma 2: 257--258. 1877; Gamble, Man. Indian Timb., ed. 1, 282 & 509. 1881; C. B. Clarke in Hook. f., Fl. Brit. India 4: 598. 1885;

Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 1035. 1893; Briq. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 4 (3a): 178. 1895; Gamble, Man. Indian Timb., ed. 2, imp. 1, 545. 1902; Brandis, Indian Trees, imp. 1, 512. 1906; Craib, Kew Bull. Misc. Inf. 1911: 445. 1911; Craib, Contrib. Fl. Siam Dicot. 166. 1912; Domin, Bibl. Bot. 89 (6): 1113. 1928; Ridl., Dispers. Pl. World pl. 9. 1930; Stapf, Ind. Lond. 2: 82. 1930; Junell, Symb. Bot. Upsal. 1 (4): 116 & 119--120, fig. 185. 1934; Dop in Lecomte, Fl. Gén. Indo-chine 4: 886 & 888. 1935; Fletcher, Kew Bull. Misc. Inf. 1938: 401, 405, & 437--438. 1938; Worsdell, Ind. Lond. Suppl. 1: 438. 1941; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 55, 59, 60, & 93. 1942; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 1035. 1946; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 129, 136, 137, & 186. 1949; Mold., Résumé 126, 176, 178, & 456. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 1: 1035. 1960; G. Taylor, Ind. Kew. Suppl. 13: 61. 1966; Brandis, Indian Timb., imp. 2, 512. 1971; Mold., Fifth Summ. 1: 283, 296, & 301 (1971) and 2: 879. 1971; Gamble, Man. Indian Timb., ed. 2, imp. 2, 545. 1972; Mold., Phytologia 23: 423 (1972), 35: 111 (1976), and 36: 38 & 42. 1977; Mold., Phytol. Mem. 2: 273, 286, 288, 293, 298, 379, 408, & 548. 1980; Mold., Phytologia 49: 442. 1981.

Illustrations: Ridl., Dispens. Pl. World pl. 9. 1930; Junell, Symb. Bot. Upsal. 1 (4): 119, fig. 185. 1934.

A straggling or climbing shrub or scrambling shrublet, to 2.5 m. tall, softly canescent-subtomentose throughout; branches tetragonal, softly pubescent or grayish-tomentose; branchlets densely and softly gray-villous, the youngest portions grayish-tomentose; leaves decussate-opposite, short-petiolate; petioles mostly very short, 5--8 mm. long, canaliculate above, pubescent-tomentose; mature leaf-blades subcoriaceous or coriaceous, ovate to subcordate or cordate-ovate, 6--10 cm. long, 5--6 cm. wide, apically rather acute or blunt and mucronate to subacute or abruptly short-acuminate, marginally entire, basally often cordate, green, shiny, and obsoletely puberulent above, grayish or softly incanous-pubescent or subvelutinous beneath; secondaries 8--10, distinct, prominent, recurved, arcuately joined in loops near the margins; tertiaries rather numerous; veinlet reticulation indiscernible; inflorescence rather ample, about 30 cm. long and 15 cm. wide, puberulent to densely and softly gray-villous or -tomentose, corymbiform-paniculate, terminal on the branches, brachiate, composed of compound, softly gray-villous, many-flowered cymes 3--5 cm. wide, basally foliose; peduncles 5--6 cm. long; flowers small, slightly scented; pedicels slender, short; calyx in anthesis scarcely 3 mm. long, distinctly venose, externally puberulent, the rim 5-dentate, the teeth small, triangular, short, broad, rotund, apically short-acuminate; corolla greenish to cream-color or white, about 10 mm. long, pubescent, the tube cylindric, 6 mm. long, the lobes 5, 4 mm. long, apically rounded; stamens 10--15 mm. long, inserted in the corolla-throat; style 15 mm. long; ovary externally villous; fruiting calyx campanulate, about 4 mm. long, the rim 5-toothed; capsule cylindric, 8--9 mm. long, about 2 mm. wide, nearly twice as long as the fruiting-calyx, apically dorsally sparingly spreading-

hirsute or villous-pilose with gray hairs, 4-valved, basally half included by the fruiting-calyx, externally glandular-punctate beneath the hairs.

The species is based on *Wallich 1741*, a number comprising two Burmese collections: (1) from "Segarin" [=Sagaing] and (2) from "versus Toung Dang", collected in 1826 and deposited in the East India Company Herbarium at Kew. The former of these, *i.e.* 1741/1, is designated as the lectotype by Fletcher (1938). Pfeiffer (1874) cites Wallich's original publication as "1831", but the page here involved was actually issued in 1829. Schauer (1847) says, apparently for material he saw in the DeCandolle Herbarium, "ab ill. coetu merc. Ind. or. comm." and also "In Indiae or. rupibus calcareis ad speluncas Demitharot editas, ad fl. Attran prov. Moulmain in regno Birmanica."

Collectors have encountered this species in old bedded dolomite beach forests, along riverbanks, in moist ground in sunny places, in scrub vegetation on sandy soil near the sea, in and along the edges of evergreen forests, climbing over limestone rocks, on rocky limestone hills and hilltops, and in open vegetation on limestone soil, from sealevel to 400 m. altitude, in anthesis in August and September, and in fruit in February. Smitinand refers to it as "common", but Hosseus as "uncommon" in Thailand.

The corollas are reported to have been "greenish" on Larsen & al. 1501, "cream-color" on Smitinand 4829, and "white" on Beusekom & Smitinand 2045 and Hosseus 5. A recorded vernacular name for the plant is "gam lang".

Junell (1934) asserts that "Bei *G. mollis* sind nur die mittleren Partien der Plazenten miteinander verwachsen....Bei *G. mollis* sind die Scheidewände in Wirklichkeit möglicherweise grösser als das Bild [fig. 185]. Sie wären nämlich an dem untersuchten Exemplare etwas verschrumpft und beschädigt. Bei *G. mollis* erfolgt wie bei *Amethystea* und *Caryopteris divaricata* eine Differenzierung des Gewebes im Fruchtknoten derart, dass bei Fruchtreife ein grosses axiales Schülchen (Gynobasis) gebildet wird. Der untere, an diesem Schülchen haftende Teil der Teilfrüchte wird als grosser, dünner Flügel ausgebildet, der ebenso lang wie das übrige Nüsschen wird. Die Gynobasis enthält offenbar einen grösseren Anteil des Fruchtknotenunterteils als bei *Amethystea*. Nach dem Abfall der Nüsschen ragt die Gynobasis aus dem Kelche hervor." *Glossocarya hemiderma* exhibits a similar gynobase.

Clarke (1885) cites only *Griffith 6017* and *Lobb s.n.* from Burma and points out that the species is closely related to *G. scandens* (L. f.) Moon "but generally more hairy", the branchlets and panicles "densely soft grey-villous", and the "Capsule rather larger, 1/3 in." Fletcher (1938) cites from Thailand: *Bourke s. n.*, *Collins 26 & 39*, *Hosseus 5*, *Kerr 3061, 4047, 4541, 8770, 10963, & 19279*, *Marcan 1890*, *Put 996*, and *Robinson 6406*. He records it also from Annam [Vietnam].

Dop (1935) cites an unnumbered Kerr collection from Thailand, unnumbered collection of Hayata from Annam, Godefroy, Gourgand, and Pierre from Cambodia, and Evrard, Pierre, and Thorel from

Cochinchina. He erroneously refers to the Craib (1911) publication as "p. 455" instead of "445". Kunz (1877) reports the species from Tenasserim and Ava in Burma, fruiting there in November. Craib (1911) cites *Hosseus* 5 from Thailand.

Material of *Glossocarya mollis* has been misidentified and distributed in some herbaria as *Clerodendron* sp., *Premna* sp., and *Caprifoliaceae*. On the other hand, the *Pierre 1208*, distributed as *G. mollis*, actually is the type collection of *G. puberula* Mold., while *Wallich 1747/2* is *Vitex pinnata* L.

Citations: BURMA: Collector undetermined 877 (Pd); *Wallich 1741/1* (Pd). THAILAND: *Bradley s.n.* (Ca--233683); *Hosseus 5* (E--118820, Mu--4196, N, V--6405); *Kerr 11147* (B); *Larsen, Smitinand, & Warncke 1501* (Ac, Ld); *Maxwell s.n.* [11-10-1969] (Ac); *Shimizu, Fukuoka, & Nalampoon T.7603* (Ac); *Smitinand 4829* (Z). KOH CHANG ISLAND: *Beusekom & Smitinand 2045* (Ac). MALAYAN ISLANDS: Langkawi: *B. C. Stone 9130* (Ac, Kl--10978).

GLOSSOCARYA MOLLIS var. *MAXWELLII* Mold., *Phytologia* 35: 111. 1977.

Bibliography: Mold., *Phytologia* 35: 111 (1977) and 36: 38. 1977; Mold., *Biol. Abstr.* 63: 6590. 1977; Mold., *Phytol. Mem.* 2: 286 & 548. 1980.

This variety differs from the typical form of the species in having the upper surface of its leaf-blades glabrous or subglabrous, usually with only very widely scattered, short, whitish hairs, more densely pilose along the midrib, and the lower surface more or less densely pubescent only along the midrib and secondary veins, widely scattered-pubescent on the lamina itself. The calyx and fruiting-calyx are densely canescent-strigose with short antrorsely appressed hairs on the outer surface, while fruits are conspicuously hirsute with perpendicular, elongate, white hairs.

The variety is based on *J. F. Maxwell 75-889* from an open evergreen area on a limestone mountain, at an altitude of 50 m., at Khao Chong, Trang Province, Thailand, collected on August 15, 1975, and deposited in the Herbarium Jutlandicum at Aarhus University. The collector describes the plant as a woody climber, the inflorescence-axes and calyx green, the corolla and filaments cream-color, the anthers gray, and the [immature] fruit dark-green. It has been misidentified and originally distributed as "*Premna flavescens* Ham. ex C. B. Clarke".

Citations: THAILAND: *Maxwell 75-889* (Ac--type, C--isotype, Z--photo of type).

GLOSSOCARYA PREMNOIDES Ridl., *Journ. Roy. Asiat. Soc. Straits* 59: 157. 1911.

Bibliography: Ridl., *Journ. Roy. Asiat. Soc. Straits* 59: 157. 1911; Prain, *Ind. Kew. Suppl.* 5, imp. 1, 115. 1921; Ridl., *Fl. Malay Penins.* 2: 636--637. 1923; Fedde & Schust., *Justs Bot. Jahresber.* 47 (2): 245. 1929; Fletcher, *Kew Bull. Misc. Inf.* 1938: 405--407, 437, & 438. 1938; Mold., *Known Geogr. Distrib. Verbenac.*, ed. 1, 60 & 93 (1942) and ed. 2, 137, 138, & 186. 1949; Mold., *Résumé* 178, 180, & 456. 1959; Prain, *Ind. Kew. Suppl.* 5, imp. 2, 115. 1960;

Mold., Fifth Summ. 1: 296 & 305 (1971) and 2: 879. 1971; Mold., Phytol. Mem. 2: 286, 296, & 548. 1980.

A shrub; stems closely brown-pubescent; principal internodes about 12.5 mm. long; leaves decussate-opposite; petioles about 6.2 mm. long; leaf-blades thinly coriaceous, ovate, at least 5 cm. long and 3.2 cm. wide, apically rounded, marginally entire, basally cordate, glabrous above, usually pubescent on the larger venation when immature, pubescent on the larger venation beneath; secondaries 4 pairs, arcuate-ascending; panicle short, dense, sessile, about 5 cm. long and 6.2 cm. wide, pubescent throughout; bracts minute; flowers numerous, small; calyx urceolate, about 3.1 mm. long, externally pubescent, very obscurely 5-lobed; corolla white, the tube slender, about 6.2 mm. long, pubescent, the limb 4-lobed, the lobes externally pubescent; stamens 4, long-exserted; filaments filiform, longer than the corolla; anthers minute, elliptic; style elongate, filiform; stigmas 2, short, filiform; fruit cylindric, about 6.2 mm. long, apically rounded, externally pubescent, dehiscing into 4 valves, each containing a single oblong seed; seeds dorsally rounded, ventrally angled.

This species is based on *Ridley 15149* from Besih Hangat, Perlis, Malaya. Ridley records the species also from Lower Thailand and comments that "Three species of *Glossocarya* are recorded, one from Ceylon, one from Burma, and one from Australia. The Perlis plant has a much more compact inflorescence than the Ceylon species, and the leaves are not cordate".

Fletcher (1938) describes it as "growing gregariously on undated banks of a river" and "on trees along river bank" in Thailand, citing *Kerr 12312* and *Winit 545*.

GLOSSOCARYA PUBERULA Mold., *Phytologia* 7: 81--82. 1959.

Bibliography: Mold., *Phytologia* 7: 81--82. 1959; Mold., *Résumé* 494. 1959; Mold., *Résumé Suppl.* 1: 12 & 25. 1959; Mold., *Biol. Abstr.* 35: 1688. 1960; Hocking, *Excerpt. Bot. A.*4: 592. 1962; G. Taylor, *Ind. Kew. Suppl.* 12: 61. 1966; Mold., *Fifth Summ.* 1: 301 (1971) and 2: 879. 1971; Mold., *Phytol. Mem.* 2: 289 & 548. 1980.

A woody and probably climbing shrub; branchlets slender, tetragonal, very densely short-pubescent or puberulent with sordid-gray hairs; nodes not plainly annulate; principal internodes 2--3.5 cm. long; leaf-scars comparatively large, elevated; leaves decussate-opposite; petioles slender, 5--10 mm. long, densely gray-puberulent; leaf-blades shortly elliptic or subrotund, thin-chartaceous, 3.5--8 cm. long, 3.5--6 cm. wide, apically rounded, marginally entire or often with a very short tooth-like projection at the very tip, basally conspicuously cordate, rather shiny and very minutely puberulent above, especially along the midrib, or glabrescent, densely gray-puberulent throughout beneath; midrib slender, flat above, prominent beneath; secondaries very slender, 3--6 per side, irregular, not in opposite pairs, arcuate-ascending, flat or obscure above, prominulous beneath; veinlet reticulation very slender, abundant, rather conspicuous but not prominent above, slightly prominulous beneath; inflorescence terminal on

short axillary twigs near the apex of the branches and forming a terminal panicle about 10 cm. long and wide, densely gray-puberulent throughout, the branches about 3 pairs, decussate-opposite; peduncles slender, tetragonal, 2--2.5 cm. long, densely gray-puberulent; sympodia resembling the peduncles in all respects; foliaceous bracts present at the nodes of the sympodia and beneath the individual cymes, resembling the leaves in form but apically rounded and somewhat densely puberulent, submembranous; bractlets linear-oblong, 1--2 mm. long, apically acute, densely puberulent on both surfaces; pedicels very slender, 1 mm. long or less; calyx cyathiform, about 2 mm. long and 1 mm. wide, externally densely appressed strigose-puberulent with sordid-gray hairs, the rim 5-toothed.

The species is based on *Pierre 1208* from an island in the river at Pinlysap, Cambodia, collected in anthesis in June, 1870, and deposited in the Britton Herbarium at the New York Botanical Garden. It was originally distributed as *G. mollis* Wall.

Citations: CAMBODIA: *Pierre 1208* (N--type).

GLOSSOCARYA SCANDENS L. f.) Trimen, Syst. Cat. Flow. Pl. Ceyl. 69. 1885.

Synonymy: *Volkameria scandens* L. f., Suppl. Pl. imp. 1, 292. 1781. *Volkameria foliis petiolatis, cordatis, ovatis, integerimis; panicula corymbosa, terminali, ramulis dichotomis* L. f. ex Lam., Encycl. Méth. Bot. 8: 69, in syn. 180. *Clerodendron linnaei* Thwaites in Thwaites & Hook. f., Enum. Pl. Ceyl. 243. 1861 [not *C. linnaei* F. Muell., 1868]. *Glossocarya linnaei* Benth. ex C. B. Clarke in Hook. f., Fl. Brit. India 4: 598. 1885; Trimen, Handb. Fl. Ceyl. 3: 363, in syn. 1895. *Glossocarya linnaei* Benth. & Hook. f. apud Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 1035. 1893. *Glossocarya scandens* Trimen, Handb. Fl. Ceyl. 3: 362. 1895; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 184. 1941. *Glossocarya scandens* (L. f.) Druce, Bot. Exch. Club Rep. 4: 615. 1917. *Glossocarya scandens* (L. f.) Moon ex Mold., Prelim. Alph. List Inv. Names 54. 1940. *Clerodendrum linnaei* Thw. ex Mold., Alph. List Inv. Names Suppl. 1: 7, in syn. 1947. *Glossocarya linnaei* (Thwaites) Benth. ex Mold., Fifth Summ. 1: 523, in syn. 1971. *Glossocarya linnaei* Clarke ex Mold., Phytologia 28: 458. 1974. *Glossocarya linnaei* Benth. & Hook. ex Mold., Phytol. Mem. 2: 407, in syn. 1980. *Glossocarya scandens* (L. f.) Trim. ex Mold., Phytol. Mem. 2: 408, in syn. 1980.

Bibliography: L. f., Suppl. Pl., imp. 1, 292. 1781; J. F. Gmel. in L., Syst. Nat., ed. 13, imp. 1, 2: 961(1789) and ed. 13, imp. 2, 2: 961. 1796; Rausch., Nom. Bot., ed. 3, 182. 1797; Lam., Encycl. Méth. Bot. 8: 691. 1808; Pers., Sp. Pl. 3: 364. 1819; Moon, Cat. Indig. Exot. Pl. Ceyl. 1: 46. 1824; Bojer, Hort. Maurit. 256. 1837; Schau. in A. DC., Prodr. 11: 657 & 662. 1847; Buek, Gen. Spec. Syn. Candol. 3: 503. 1858; Thwaites & Hook. f., Enum. Pl. Zeyl., imp. 1, 243. 1861; F. Muell., Fragm. 6: 151--152. 1868; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1158. 1876; Maxim., Bull. Acad. Imp. Sci. St. Pétersb. 23: 390. 1877; C. B. Clarke in

Hook. f., Fl. Brit. India 4: 598. 1885; Trimen, Journ. Ceyl. Br. Roy. Asiat. Soc. 9: [Syst. Cat. Flow. Pl. Ceyl.] 69. 1885; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 1, 1: 1035. 1893; Trimen, Handb. Fl. Ceyl. 3 & 362 (1895) and Atlas 3: pl. 73. 1895; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 1, 184. 1902; Gamble, Man. Indian Timb., ed. 2, 544--545. 1902; J. C. & M. Willis, Rev. Cat. Flow. Pl. Ceyl. [Perad. Man. Bot. 2:] 69. 1911; Druce, Bot. Exch. Club Rep. 4: 615. 1917; Stapf, Ind. Lond. 3: 293. 1930; Junell, Symb. Bot. Upsal. 1 (4): 119 & 120. 1934; L. f., Suppl. Pl., imp.], 292. 1936; Mold., Prelim. Alph. List Inv. Names 26. 1940; Durand & Jacks., Ind. Kew. Suppl. 1, imp. 2, 184. 1941; Mold., Alph. List Inv. Names 25. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 56 & 93. 1942; MacMillan, Trop. Plant. Gard., ed. 5, 136. 1943; Savage, Cat. Linn. Herb. Lond. 110. 1945; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 2, 1: 1035. 1946; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 130 & 186. 1949; Abeywickrama, Ceyl. Journ. Sci. Biol. 2: 218. 1959; Mold., Résumé 167, 218, 266, 268, 273, 296, 392, & 456. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., imp. 3, 1: 1035. 1960; Thwaites & Hook. f., Enum. Pl. Zeyl., imp. 2, 243. 1964; Gunawardena, Gen. Sp. Pl. Ceyl. 148. 1968; Mold., Fifth Summ. 1: 281, 363, 449, 450, & 463 (1971) and 2: 523, 734, & 879. 1971; Mold., Phytologia 23: 432 (1972), 28: 458 (1974), 36: 437 (1977), 38: 498 (1978), and 44: 221. 1979; Hocking, Excerpt. Bot. A.33: 87. 1979; Mold., Phytol. Mem. 2: 268, 354, 387, 388, 407, 408, 461, 462, & 548. 1980.

Illustrations: Trimen, Hand. Fl. Ceyl. Atlas 3: pl. 73 (in color). 1895.

A straggling, often tangled, scandent or subscandent, vine-like shrub or woody liana; branches divaricate, to 6 or 8 m. long, the younger ones subterete, finely pilose-pubescent, sometimes converted into short, rigid, horizontal spines; bark pale, smooth; leaves decussate-opposite; petioles 4--6 mm. long; leaf-blades ovate or obovate to obovate-rotund, 5--10 cm. long, to 4 cm. wide, apically acute or apiculate, marginally entire, basally subcordate, pilosulous above when young, paler beneath and minutely glandular-punctate, pilose beneath especially on the venation, glabrescent when mature, the venation finely reticulate; panicles terminal, corymbiform, compact, foliose, to 8 cm. wide, incanous-pilose or gray-tomentose; peduncles rather long, axillary, divaricate, stiff, pubescent; bracts elliptic or oblong, about 8 mm. long, apically acute, pubescent, the lower ones sometimes foliaceous; flower-buds green or blue; flowers sessile or nearly so; pedicels subobsolete; calyx hypocrateriform, to 3 mm. long in anthesis, extremely finely pubescent, the rim shortly 5-dentate, the teeth shallow or broadly triangular, apically rounded or acute; corolla white, externally pilose or strigose, the tube slender, 6--8 mm. long, the limb about 1 cm. wide, the lobes oblong, 3--4 mm. long, apically obtuse, the lower one slightly longer than the others; filaments greatly elongate, about 2.5 cm. long; anthers yellow; style a little longer than the stamens; gynobase and wings absent; fruiting-calyx about 4 mm. wide; capsule clavate-oblong, 6--9 mm. long, about 4 mm. wide, at first green, maturing blue, a-

pically very blunt, externally finely gray-strigose or tomentose; seeds linear-oblong.

This species is based on *König* 77 from "circa flumen magnum Monesi-moti-Kandel", Sri Lanka, deposited in the Linnean Herbarium in London. The type is filed under genus 809, *Volkameria*, and is sheet number 6, inscribed "*scandens*" in the handwriting of the younger Linnaeus. There are also two tickets by *König*. The younger Linnaeus has added the words "*König* 77" according to Jackson. One of the tickets says "*Volkameria scandens*. Foliis bifaris, oppositis, corymbis laxis, spicatis. Monesi-Mote Kendal." The other ticket reads "*Volkameria scandens*. Habitat in vastis sylvis Zeylonae, super scandit arbores altissime eisque coronat suo floribus niveis. *König* 77" and on the reverse: "V. inermis, scandens, fol. ramulis tomentosus, fol. cordatis-ovatis glaberrimis. Pedunculi terminalibus: ramuli dichotomi."

Our good friend, Magdon Jayasuriya, has written to me about his efforts to pinpoint the type locality: "I took a big effort to trace this or any similar place all along the eastern coast (province) using the maps and the Gazetteer; but without luck. It is possible these old names do not exist now."

Collectors have found the plant growing on or about rock outcrops, along roadsides, in jungles, forests, and primary forest edges, in open scrub forests with scattered tall trees, on clay flats, in dry regions on the dry zone on tank bunds, and on the bottom of abandoned irrigation tanks, at 3--150 m. altitude, in anthesis from November to August.

The corollas are described as "white" on *Fosberg & Sachet* 52923, *Kostermans* 24327, *Waas* 598, and *Wirawan* 1205 and by Mac Millan (1947) and as "pure-white" on *Jayasuriya* 2038 and by Trimmen (1895).

The species appears to be endemic to Sri Lanka and is there now rather rare in the forests of the dry region. It has been introduced into cultivation in Mauritius according to Bojer (1837). Fosberg & Sachet report it "locally common in low swampy ground, tangled in the shrubs of thickets". The only recorded vernacular name is "climbing volkameria", a so-called "book-name".

Junell (1934) asserts that "Bei *G. Linnaei* liegt keine Gynobasis und natürlich auch keine Flügel vor."

Thwaites (1861) comments that "This is most probably, I think, *Volk. scandens*, Linn. f.; but, as the description of the latter does not quite accord with our plant, and as the name of *Clerod. scandens* has been applied by Palisot de Beavois to another species of the genus [*Clerodendrum*], I have thought it best to call the plant *Cler. Linnaei*." He lists it as occurring in only the "Hot, drier parts of the island" of Sri Lanka, citing only his *C.P.1948*. Trimmen (1895) asserts that *König's* plant collections are also preserved, in part, in the herbarium of the British Museum, but I have personally examined the type [holotype] of the species in the Linnean Society's herbarium. Trimmen also comments that this plant is "A beautiful climber over large trees, which it covers with masses of blossoms, but capable of growing as a bush. The fruit

first splits septically into two halves, then each half again into two. There can be no doubt of this being the plant of Linn. fil., but his name is not quoted in Fl. B. Ind."

Material of *G. scandens* has been misidentified and distributed in some herbaria as *Clerodendron* sp., *Clerodendrum* sp., and even *Vitex* sp.

Citations: SRI LANKA: *Collector undetermined* s.n. [Anuradhapura, Aug. 1885] (Pd), s.n. [Kalawewa, Feb. 1888] (Pd), s.n. [near Puttlam, July 1883] (Pd); *Fosberg & Mueller-Dombois* 50142 (Z); *Fosberg & Sacht* 52923 (N, Z); *Gardner* s.n. [Thwaites C.P. 1948, Jaffna] (Pd), s.n. [Thwaites C.P. 1948, Puttlam] (Pd); *König* 77 [Herb. Linnaeus G.809, S.6] (It--photo of type, Ls--type, N--photo of type, S--isotype, Z--photo of type); *Kostermans* 24327 (W--2765613); *Kundu & Balakrishnan* 187 (W--2765234); *Thwaites C.P. 1948* in part [Naval Aru, March 1858] (Pd), 1948 in part (Br), s.n. (N); *Waas* 598 (Ld, W--280344, Z); *Wirawan* 1205 (Lc, W--2868189); *Worthington* 5297 (K). MOUNTED ILLUSTRATIONS: Trimen, Hand. Fl. Ceyl. Atlas 3: pl. 73. 1895 (Z, Z).

GLOSSOCARYA SCANDENS f. *PUBESCENS* (Mold.) Mold., *Phytologia* 38: 498. 1978.

Synonymy: *Glossocarya scandens* var. *pubescens* Mold., *Phytologia* 36: 437--438. 1977.

Bibliography: Mold., *Biol. Abstr.* 64: 6575. 1977; Mold., *Phytologia* 36: 437--438 (1977) and 38: 498. 1978; Mold., *Biol. Abstr.* 66: 1277. 1978; Hocking, *Excerpt. Bot. A.33*: 87. 1979; Mold., *Phytol. Mem.* 2: 268, 408, & 549. 1980.

This form differs from the typical form of the species in having the lower surface of its leaf-blades permanently densely pubescent.

The form is based on *Jayasuriya* 2038 from beside rock outcrops south of the Komari bridge, north of Pottuvil, at a low altitude, Sri Lanka, collected on May 4, 1975, and deposited in the Britton Herbarium at the New York Botanical Garden. The collector describes it as a very scandent shrub, the branches to 6 m. long, and the corollas pure-white. The plant has also been encountered in jungles, on rock outcrops, and on woody and shrubby hillsides, at 150 m. altitude, flowering in March and May. *Jayasuriya* always refers to the corollas as "pure white"; *Bernardi* says that the flowers are borne in "white corymbs".

Citations: SRI LANKA: *Bernardi* 14182 (W--2766471); *Jayasuriya* 2031 (Ld, Pd, W--2807759), 2038 (Ac--isotype, Ld--isotype, N--type, Pd--isotype, W--2807850--isotype), 2108 (Ac, Pd, W--2807748); *Thwaites C.P. 1948* in part [Negumbo, 1854] (Bz--21045, Pd).

GLOSSOCARYA SIAMENSIS Craib, *Kew Bull. Misc. Inf.* 1922: 240. 1922.

Synonymy: *Clerodendron squiresii* Merr., *Journ. Arnold Arb.* 19: 64. 1938.

Bibliography: Craib, *Kew Bull. Misc. Inf.* 1922: 240. 1922; A. W. Hill, *Ind. Kew. Suppl.* 7: 103. 1929; Fedde & Schust., *Justs Bot. Jahresber.* 53 (1): 1074. 1932; Dop in *Lecomte, Fl. Gén. Indo-chine* 4: 874 & 887--888, fig. 90 (9) & 91 (1--3). 1935; Fletcher, *Kew*

Bull. Misc. Inf. 1938: 405--407 & 437--438. 1938; E. D. Merr., Journ. Arnold Arb. 19: 64 (1938) and 21: 385. 1940; Worsdell, Ind. Lond. Suppl. 1: 438. 1941; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 59, 60, & 93. 1942; Mold., Alph. List Inv. Names 20. 1942; Mold., Known Geogr. Distrib. Verbenac., ed. 2, 136, 137, & 186. 1949; Mold., Résumé 176, 178, 270, & 456. 1959; Mold., Fifth Summ. 1: 296, 301, & 456 (1971) and 2: 879. 1971; Mold., Phytologia 34: 19 & 264. 1976; Mold., Phytol. Mem. 2: 286, 293, & 549. 1980.

Illustrations: Dop in Lecomte, Fl. Gén. Indo-chine 4: 874 & 887, fig. 90 (9) & 91 (1--3). 1935.

A shrub, under 5 m. tall; branches rather densely and crisped short-pubescent when young, finally glabrous; bark pale-brown, conspicuously striate; leaves decussate-opposite; petioles 6--10 mm. long, canaliculate above; leaf-blades chartaceous, paler beneath, ovate or oblong, to 9 cm. long and 5.5 cm. wide, apically short-acuminate, marginally entire, basally cordate or broadly cordate, pubescent on the midrib and larger venation on both surfaces but more sparsely so beneath; secondaries 4 or 5, arcuately joined at the margins, conspicuous above, prominent beneath; corymbs terminal and also in the upper leaf-axils and there either borne on leafless peduncles or terminating short twigs, subequaling the subtending leaves or slightly surpassing them, 3--7 cm. wide; partial peduncles to 2.5 cm. long, sometimes with small leaves at the base, rather densely short-pubescent; pedicels short, rather densely short-pubescent; flowers slightly scented; calyx obpyramidal-cupuliform, about 3 mm. long, externally puberulent, distinctly venose, the rim denticulate; corolla white; anthers blackish; style purple; fruit about 8 mm. long and 2.5 mm. wide, externally puberulent, with scattered longer hairs intermixed.

The species is based on Kerr 4502 from along a canal at Bangkok, Krungtep, Thailand, at less than 5 m. altitude. Fletcher (1938) cites also Kerr 19530 and Put 2673 from Thailand. Merrill (1940) says "Although I have seen no fruiting material representing the species described as *Clerodendron Squiresii* Merr. in 1938, I am now convinced that the type of the latter species represents the allied genus *Glossocarya*, and the species described in 1922 as *G. siamensis* Craib."

Collectors have encountered *G. siamensis* along roadsides and canals, at 5--100 m. altitude, in anthesis in March, August, and September and in fruit in August. Smitinand reports it "common" on riverbanks and the edges of swamps in Thailand.

Material has been misidentified and distributed in some herbaria as *Hymenopyramis* sp. On the other hand, the Maxwell 71-487, distributed as *G. siamensis*, is the type collection of its var. *pubescens* Mold. and Pierre 1208 is the type collection of *G. puberula* Mold.

Citations: THAILAND: Maxwell 72-389 (Ac); Smitinand 2886 [Herb. Roy. Forest Dept. 12917] (Ac, Z), 2941 (Ac, Z). VIETNAM: Annam: Squires 858 (Bz--20742, Mu, N, N--photo, S, Z--photo). Cochinchina: Evrard 2764 [field no. 82] (N, S); Pierre s.n. [Bien-hoa, 6/165] (Ca--54795, S), s.n. [Bien-hoa, 7/1865] (N), s.n. (B);

Thorel 595 (B).

GLOSSOCARYA SIAMENSIS var. *PUBESCENS* Mold., *Phytologia* 34: 19. 1976.

Bibliography: Mold., *Phytologia* 34: 19 & 264. 1976; Mold., *Phytol. Mem.* 2: 286 & 549. 1980.

This variety differs from the typical form of the species in having the pubescence throughout the inflorescences far more dense, conspicuous, and spreading and the lower leaf-surfaces more or less distinctly spreading-pilose-pubescent, especially on the larger venation.

The variety is based on *Maxwell* 71-487 from a dense thicket along a trail at Howa Pie, Angthong, Thailand, collected on August 15, 1971, and deposited in the Aarhus University herbarium. Thus far it is known only from the original collection.

Citations: THAILAND: *Maxwell* 71-487 (Ac--type).

NOTES ON THE GENUS *HYMENOPYRAMIS* (VERBENACEAE)

Harold N. Moldenke

It being manifestly impractical to attempt the formal monograph of this genus so long planned and previously announced, only the bibliographic and herbarium notes assembled by my wife, Alma L. Moldenke, and myself over the past 52 years are herewith placed on record for use by future monographers. This is the 76th genus thus far treated by us in this series of papers in this and certain other journals. The herbarium acronyms herein employed are the same those used in all of our previous papers in this series and are most recently explained in full in *Phytologia Memoirs* 2: 463--469 (1980) and *Phytologia* 50: 268 (1982).

HYMENOPYRAMIS Wall., *Numer. List* [25], no. 774, hyponym. 1829; W. Griff., *Calcut. Journ. Nat. Hist.* 3: 365. 1843.

Synonymy: *Hymenolepis* Craib ex Mold., *Résumé Suppl.* 3: 32, in syn. 1962 [not *Hymenolepis* Cass., 1817, nor Kaulff., 1824]. *Hymenopyramis* "Wall. ex Griff." apud Airy Shaw in J. C. Willis, *Dict. Flow. Pl.*, ed. 7, 568. 1966. *Hymenopyranis* Wall. ex Mold., *Phytologia* 23: 432, in syn. 1972. *Hymenofyranus* Wall. ex Mold., *Phytologia* 23: 432, in syn. 1972.

Bibliography: Wall., *Numer. List* [25], no. 774. 1829; Endl., *Gen. Pl.* 638. 1838; Sweet, *Hort. Brit.*, ed. 3, 764. 1839; Meisn., *Pl. Vasc. Gen. Comm.* 2: 197. 1840; Spach, *Hist. Nat. Vég. Phan.* 9: 228. 1840; Steud., *Nom. Bot. Phan.*, ed. 2, 1: 784. 1840; Reichenb., *Deutsch. Bot. [Repert. Herb. Nom.]* 108. 1841; W. Griff., *Calcut. Journ. Nat. Hist.* 3: 365. 1843; Voigt, *Hort. Suburb. Calc.* 464 & 472. 1845; Walp., *Repert. Bot. Syst.* 4: 133. 1845; Lindl., *Veg. Kingd.*, ed. 1, 664 (1846) and ed. 2, 664. 1847; Schau. in A. DC.,